

WE CLAIM:

1. A handheld electronic device comprising:

a case body;

a touch control input module mounted on said case
5 body and including

a protective layer having an outer surface exposed
from said case body, and an inner surface opposite to
said outer surface, said outer surface being defined
with a plurality of contact regions, each of said contact
10 regions being marked with a symbol,

a sensing layer in contact with said inner surface
of said protective layer, said sensing layer being
responsive to contact of an object with said outer surface
of said protective layer so as to generate an electrical
15 output indicative of contact position of the object with
said outer surface of said protective layer, and

a signal processing unit coupled electrically to
said sensing layer for receiving the electrical output
and for generating a control output corresponding to
20 the electrical output; and

a processing device disposed in said case body,
coupled electrically to said signal processing unit,
and responsive to the control output from said signal
processing unit so as to perform an operation associated
25 with the control output.

2. The handheld electronic device as claimed in Claim
1, wherein said signal processing unit includes a

coordinate computing unit coupled electrically to said sensing layer for receiving the electrical output and for generating a coordinate output corresponding to the electrical output, and an encoder coupled electrically to said coordinate computing unit for receiving the coordinate output and for generating the control output that corresponds to the coordinate output and that is provided to said processing device.

3. The handheld electronic device as claimed in Claim 2, wherein said encoder is operable in a selected one of a key input mode, where the control output generated by said encoder corresponds to the symbol marked on said contact region that is associated with the coordinate output from said coordinate computing unit, and a handwriting input mode, where the control output generated by said encoder corresponds to movement of the object on said outer surface of said protective layer.

4. The handheld electronic device as claimed in Claim 3, wherein said signal processing unit further includes a mode control unit associated operably with said encoder for enabling operation of said encoder in the selected one of the key input mode and the handwriting input mode.

5. The handheld electronic device as claimed in Claim 3, wherein the symbols marked on said contact regions of said outer surface of said protective layer are distinct from each other.

6. The handheld electronic device as claimed in Claim 2, wherein said outer surface of said protective layer is configured with a block that contains at least an adjacent pair of said contact regions, and the control output generated by said encoder corresponds to said block when successive ones of the coordinate outputs from said coordinate computing unit within a predetermined time period indicate movement of the object from one of said contact regions in said adjacent pair to the other of said contact regions in said adjacent pair.

7. The handheld electronic device as claimed in Claim 2, wherein said outer surface of said protective layer is configured with a block that contains one of said contact regions, and the control output generated by said encoder corresponds to said block when successive ones of the coordinate outputs from said coordinate computing unit within a predetermined time period indicate movement of the object along a length of said one of said contact regions contained in said block.

8. The handheld electronic device as claimed in Claim 1, wherein said outer surface of said protective layer is a flat surface.

9. The handheld electronic device as claimed in Claim 1, wherein said outer surface of said protective layer is a curved surface.

10. The handheld electronic device as claimed in Claim 1, wherein the symbols are printed on said contact regions using one of lithographic, relief and intaglio printing techniques.

5 11. The handheld electronic device as claimed in Claim 10, wherein the symbols are printed on said contact regions using a paint material that contains one of a phosphorescent material and a fluorescent material.

10 12. The handheld electronic device as claimed in Claim 1, wherein said contact regions are defined on said outer surface of said protective layer by printing using one of lithographic, relief and intaglio printing techniques.

15 13. The handheld electronic device as claimed in Claim 12, wherein said contact regions are defined on said outer surface of said protective layer by printing using a paint material that contains one of a phosphorescent material and a fluorescent material.

20 14. The handheld electronic device as claimed in Claim 1, wherein the symbols of said contact regions project from said outer surface of said protective layer.

15. The handheld electronic device as claimed in Claim 1, wherein the symbols of said contact regions are engraved in said outer surface of said protective layer.

25 16. A touch control input module comprising:

a protective layer having opposite outer and inner surfaces, said outer surface being defined with a

plurality of contact regions, each of said contact regions being marked with a symbol;

a sensing layer in contact with said inner surface of said protective layer, said sensing layer being responsive to contact of an object with said outer surface of said protective layer so as to generate an electrical output indicative of contact position of the object with said outer surface of said protective layer; and

a signal processing unit coupled electrically to said sensing layer for receiving the electrical output and for generating a control output corresponding to the electrical output.

17. The touch control input module as claimed in Claim 16, wherein said signal processing unit includes a coordinate computing unit coupled electrically to said sensing layer for receiving the electrical output and for generating a coordinate output corresponding to the electrical output, and an encoder coupled electrically to said coordinate computing unit for receiving the coordinate output and for generating the control output that corresponds to the coordinate output.

18. The touch control input module as claimed in Claim 17, wherein said encoder is operable in a selected one of a key input mode, where the control output generated by said encoder corresponds to the symbol marked on said contact region that is associated with the coordinate output from said coordinate computing unit, and a

handwriting input mode, where the control output generated by said encoder corresponds to movement of the object on said outer surface of said protective layer.

19. The touch control input module as claimed in Claim 5 18, wherein said signal processing unit further includes a mode control unit associated operably with said encoder for enabling operation of said encoder in the selected one of the key input mode and the handwriting input mode.

20. The touch control input module as claimed in Claim 10 18, wherein the symbols marked on said contact regions of said outer surface of said protective layer are distinct from each other.

21. The touch control input module as claimed in Claim 15 17, wherein said outer surface of said protective layer is configured with a block that contains at least an adjacent pair of said contact regions, and the control output generated by said encoder corresponds to said block when successive ones of the coordinate outputs from said coordinate computing unit within a 20 predetermined time period indicate movement of the object from one of said contact regions in said adjacent pair to the other of said contact regions in said adjacent pair.

22. The touch control input module as claimed in Claim 25 17, wherein said outer surface of said protective layer is configured with a block that contains one of said contact regions, and the control output generated by

said encoder corresponds to said block when successive ones of the coordinate outputs from said coordinate computing unit within a predetermined time period indicate movement of the object along a length of said one of said contact regions contained in said block.

23. The touch control input module as claimed in Claim 16, wherein said outer surface of said protective layer is a flat surface.

24. The touch control input module as claimed in Claim 16, wherein said outer surface of said protective layer is a curved surface.

25. The touch control input module as claimed in Claim 16, wherein the symbols are printed on said contact regions using one of lithographic, relief and intaglio printing techniques.

26. The touch control input module as claimed in Claim 25, wherein the symbols are printed on said contact regions using a paint material that contains one of a phosphorescent material and a fluorescent material.

27. The touch control input module as claimed in Claim 16, wherein said contact regions are defined on said outer surface of said protective layer by printing using one of lithographic, relief and intaglio printing techniques.

28. The touch control input module as claimed in Claim 27, wherein said contact regions are defined on said outer surface of said protective layer by printing using

a paint material that contains one of a phosphorescent material and a fluorescent material.

29. The touch control input module as claimed in Claim 16, wherein the symbols of said contact regions project
5 from said outer surface of said protective layer.

30. The touch control input module as claimed in Claim 16, wherein the symbols of said contact regions are engraved in said outer surface of said protective layer.